View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Scientific Journals of Bogor Agricultural University

Oral Presentation (PCS-7)

Lead Detection in Blood and Liver of Cattle sold in the Traditional Market of Denpasar City

I Ketut Berata[1]*, Ni Nyoman Werdi Susari[2], I Wayan Sudira[3], I Made Kardena[1]

[1]Laboratory of Veterinary Pathology; [2]Laboratory of Veterinary Anatomy and Histology; [3]Laboratory of Veterinary Pharmacology and Toxicology, Faculty of Veterinary Medicine of Udayana University, Bali - Indonesia
*Corresponding author's email: beratabudur@gmail.com

Keywords: AAS, blood, food safety, lead, liver.

INTRODUCTION

Lead contamination in many foods is reported to endanger consumers' health. Beef as one of the food of animal origin can be contaminated by lead mainly due to the maintenance of cattle in contaminated areas. Balinese cattle that are kept in urban landfills are reported to be contaminated with high levels of lead in the blood and in other tissues with lower levels [4]. The threat of human health from eating foods that contain leads can cause anemia because leads can substitute iron in hemoglobin [2]. Lead poisoning can also cause malfunction of various organs such as liver, kidney [1], lungs, spleen [7] and brain [9] in the form of cognitive impairment [5]. The high threat due to contamination of leads to health, then the meat health check should also be made on the presence of leads. One of the inspection efforts on the presence of lead contamination in beef, then the place of sale in the traditional market is a good location for sampling examination.

MATERIALS AND METHODS

Research samples consist of blood and liver that obtained from four traditional market in Denpasar city those are Ketapean, Kreneng, Balun and Sanglah market. The number of samples from each market was taken as many as 30 blood and liver samples, so the total number of samples examined were 120 samples respectively. Sampling is done every 3 days to avoid samples coming from the same cattle.

Measurement of blood and liver lead levels was performed at Analytical Laboratory of Udayana University, by atomic absorption spectrophotometry (AAS) method [8]. The results of the measurements were analyzed descriptively and analyzed the correlation between blood lead levels against the liver lead levels.

RESULT AND DISCUSSION

After measurements of blood and liver lead levels of 120 samples, the mean blood lead level was 2.94 ± 0.23 ppm and in the liver was 0.60 ± 0.70 ppm. These results indicate the blood lead level exceeds the recommended maximum [3] ie 2.00 ppm. This means that cattle blood sold in the traditional market of Denpasar City is not safe for food. While the levels of leads in the liver is still safe for consumption.

The average lead level among the sampling market, did not show any significant difference. This shows that the beef sold in four traditional markets comes from the same distributor. The average comparison of lead rates in the traditional markets examined is presented in Figure 1.

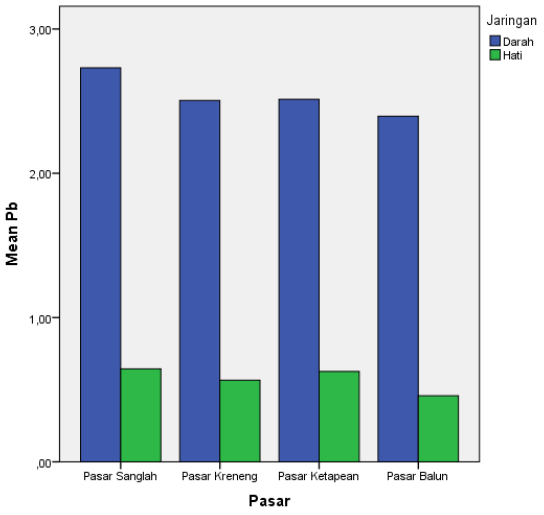

Fig.1. Comparison of lead contamination in the blood & liver of cattle from four traditional market examined

The results of correlation analysis showed no positive relationship between blood lead levels with the liver. These results indicate that leads in the blood and tissues do not have patterns such as organic matter, as reported by some researchers [1].

CONCLUSION

The average lead level in blood of cattle sold in the traditional market of Denpasar City was 2.94 ± 0.23 ppm, while mean lead level in liver was 0.60 ± 0.70 ppm. The blood lead level exceeds the recommended maximum level (2.00 ppm), so it is not worth consuming. There is no positive correlation between blood lead levels and lead levels in the liver.

ACKNOWLEDGMENTS

Authors thank to the Directorate General of Research and Public Service, Ministry of Research, Technology and High Education in Indonesia for the funding support on this research.

REFERENCES

[1] Akan *et al*. 2010. *Res J Appl Sci Engin and Technol* 2(8):743-748.

[2] Apostoli. et al 1988. *International Archieves of Occupational and Environ Health* 61(1):71-75.

[3] BSN. 2009. Standar Nasional Indonesia (SNI) 7387-2009: 1-25.

[4] Berata *et al.* 2016. *J Vet* 17(4):641-646.

[5] Brochin *et al*. 2008. *The Georgetown Undergraduate J of Health Sci* 5(2):1-8.

[6] Hegazy AMS, Fouad UA. 2015. *Forensic Med and Anat Res* 2:70-79.

[7] Sharma *et al*. 2014. *Hindawi Publishing Corporation BioMed Res International* 1-26.

[8] Sikiric *et al*. 2003. *Czech J Anim Sci* 48(11):481–486.

[9] Toscano CD, Guilarte TR. 2005. *Brain Res Rev* 49(3):529-554.